

Alg. 2 Warm Up # 8-4

Quiz practice.

Solve by the indicated method.

1. Zero product property

$$15x^3 + 55x^2 - 100x = 0$$

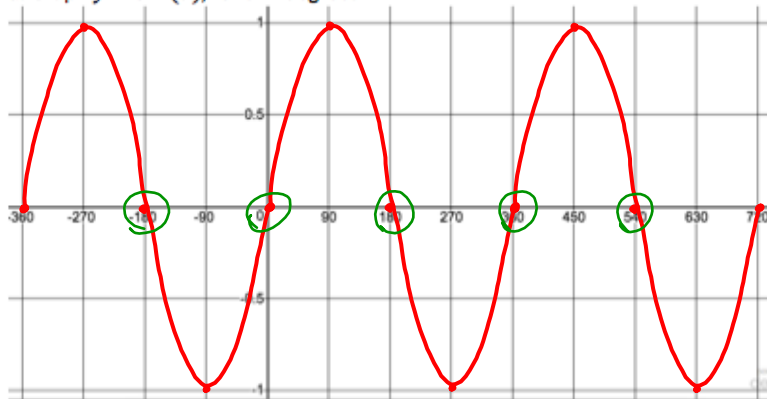
2. Completing the Square

$$4x^2 + 48x = 3$$

3. Quadratic Formula

$$5x^2 - 3x - 9 = 0$$

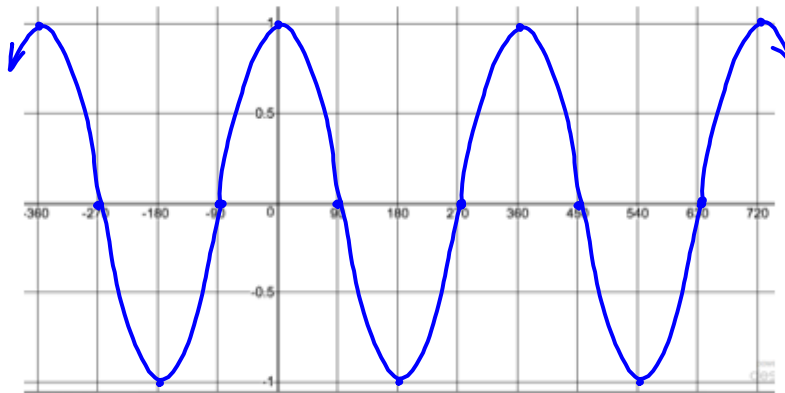
Yesterday's Classwork

4. Graphing $y = \sin(\theta)$ and $y = \cos(\theta)$: Use your unit circle, not your calculator, to graph.a. Graph $y = \sin(\theta)$, for θ in degrees θ -intercepts: _____

y-intercept: _____

Name the angles where there is a maximum: _____ where there is a minimum: _____

What is the length of one cycle? _____

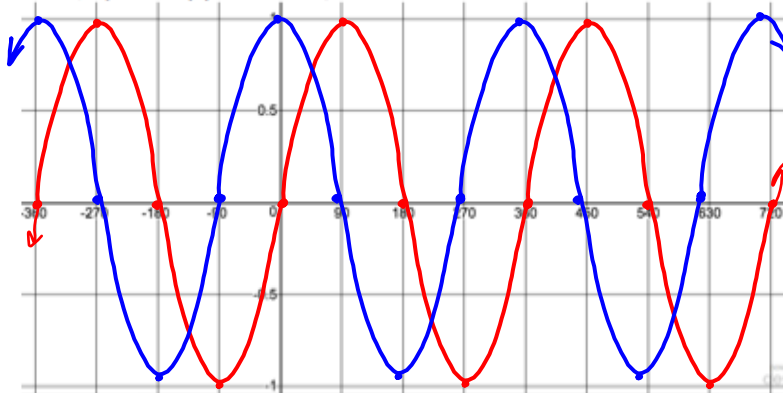
b. Graph $y = \cos(\theta)$  θ -intercepts: _____

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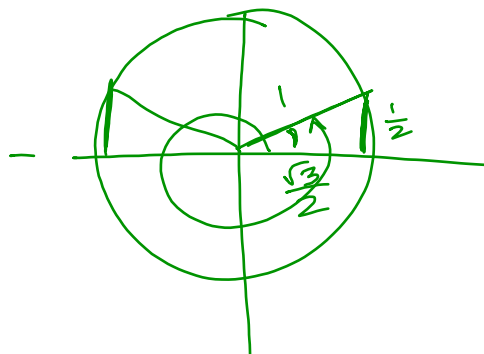
Algebra 2B Classwork 7.1 Summary

Name _____ Per. _____

Refer to the graphs on the back of your tan classwork, #4.

1. On your graph of $y = \sin \theta$, circle where any angle has a sine of $\frac{1}{2}$.a) On the interval $-360^\circ < \theta < 720^\circ$, how many solutions are there to the equation $\sin(\theta) = \frac{1}{2}$?

b) If you graphed them all on the unit circle, what would their reference angle(s) be?

2. Let n = any integer.a) For the graph of $y = \sin \theta$, write an expression for all the θ - intercepts in terms of n . (hint: Think about how far apart they are.)

$$\theta = 180n$$

b) Now write the expression for θ in radians.

$$\theta = \pi n$$

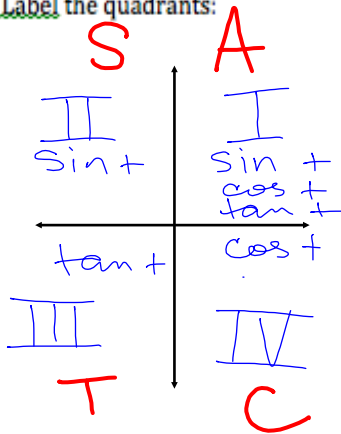
c) For the graph of $y = \cos \theta$, write an expression for the θ - intercepts for: θ in degrees θ in radians

$$\theta = 90n$$

$$\theta = \frac{\pi}{2}n$$

3. The unit circle is divided into four quadrants, labeled using the Roman Numerals I, II, III, IV.

a) Label the quadrants:



b) In which quadrant(s) will the sine of θ have a positive value?

I & II

c) In which quadrant(s) will $\cos \theta$ be positive?

I & IV

d) In which quadrant(s) will the $\tan \theta$ be positive?

I & III

CP's: 7- #99 ---> 103 (green WS & graph) p. 341

7.1.7 What is tangent?

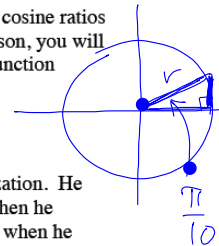
The Tangent Function



In the past several lessons, you have used your understanding of the sine and cosine ratios to develop and interpret the functions $s(\theta) = \sin \theta$ and $c(\theta) = \cos \theta$. In this lesson, you will expand your understanding by exploring the tangent ratio and graphing the function $t(\theta) = \tan \theta$.

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$\frac{\sin}{\cos}$



7-99. Jamal was working on his homework when he had a brilliant realization. He was drawing a triangle in a unit circle to estimate the sine of $\frac{\pi}{10}$, when he realized that this triangle is the same kind of triangle that he draws when he wants to find the slope of a line.

- How could you express the slope of the radius in terms of sine and cosine?
- Is there any other way you can use a trigonometric ratio to represent the slope? Discuss this with your team.

a) slope of $r = \frac{\sin \theta}{\cos \theta}$

b) $\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{\sin \theta}{\cos \theta} = \frac{y}{x}$

Further Guidance

7-101. For each triangle in the first quadrant of the unit circle on your resource page, label the sine and cosine.

- a. Use your knowledge of tangent to complete a table like the one below. Start with the exact values for the sine and cosine.

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$ (exact)	$\tan \theta$ (approximate to nearest 0.01)
$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$	
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$		
$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$		

- b. Plot the tangent values on the graph to the right of the unit circle.
- c. Draw five new triangles that are congruent to the first five, but that are located in the second quadrant. Add values for these new angles to your table and your graph.
- d. Continue this process by drawing triangles in the third and fourth quadrants. You should have a total of twenty triangles drawn and twenty angle values on your graph. If you have not done so already, add data to your table and points to your graph corresponding to the intercepts of the unit circle.

7-102. Investigate the tangent graph by analyzing the following questions:

- a. Describe the domain and range of the tangent function.
- b. Describe any special points or asymptotes.
- c. Does it have symmetry? Describe any symmetry you see in the graph.
- d. How is the graph of $t(\theta) = \tan \theta$ different from the graphs of $s(\theta) = \sin \theta$ and $c(\theta) = \cos \theta$?

===== *Further Guidance* =====
section ends here.

7-103. Draw a new unit circle and label a point that corresponds to a rotation of $\frac{\pi}{6}$ radians.

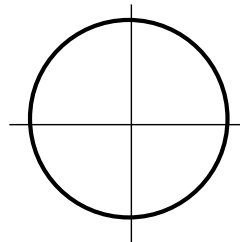
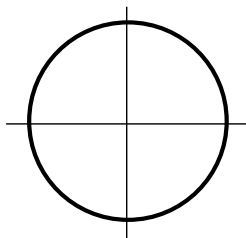
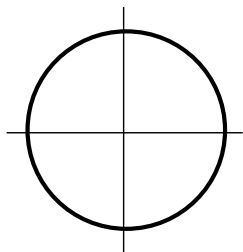
- What are the coordinates of this point? Use exact values.
- Use this information to find each of the following values without a calculator. (Hint: Drawing each angle on the unit circle will be very helpful.)



i: $\tan\left(\frac{7\pi}{6}\right)$

ii: $\cos\left(\frac{13\pi}{6}\right)$

iii: $\tan\left(\frac{2\pi}{3}\right)$



Get organized and staple up:

Week 8 Classwork

Warm up

Blue, 7 - #71 ---> 76

7 - #86 ---> 89, with big unit circle

Tan, 7.1.6 WS

White, 7.1 Summary WS

Green, 7 - # 99, 101 - 103
with half sheet Tangent graph

HW: 7-

#104 ---> 112

Short Quiz tomorrow:
Solving Quadratics all three ways.